

[Abstract of the Disclosure]

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5 A method for adjusting the optical properties of an anti-reflective coating layer by thermal annealing is described. In the method, a dielectric ARC layer of SiON is first deposited by plasma enhanced CVD to a thickness of at least 500 Å. The dielectric ARC layer is deposited on a silicon nitride layer or on a polysilicon layer which can withstand the annealing temperature used for the dielectric ARC layer. The dielectric ARC layer can be annealed at a temperature of at least 400°C, or in a temperature range between about 400°C and about 1,000°C. The annealing process can be conducted in a gas environment that contains at least one of N₂ and O₂. A suitable annealing time is between about 1 min. and about 30 min., or preferably between about 3 min. and about 5 min. The annealing process has substantially no effect on the value of the reflective index, n, the present invention novel method allows adjustment in the extinction coefficient, k, to be made independently in the SiON dielectric ARC layer.